(No Model.) 2 Sheets—Sheet 1.

J. F. HATFIELD.

GRAIN SEPARATOR.

No. 306,612. Patented Oct. 14, 1884.

Fig. 1.

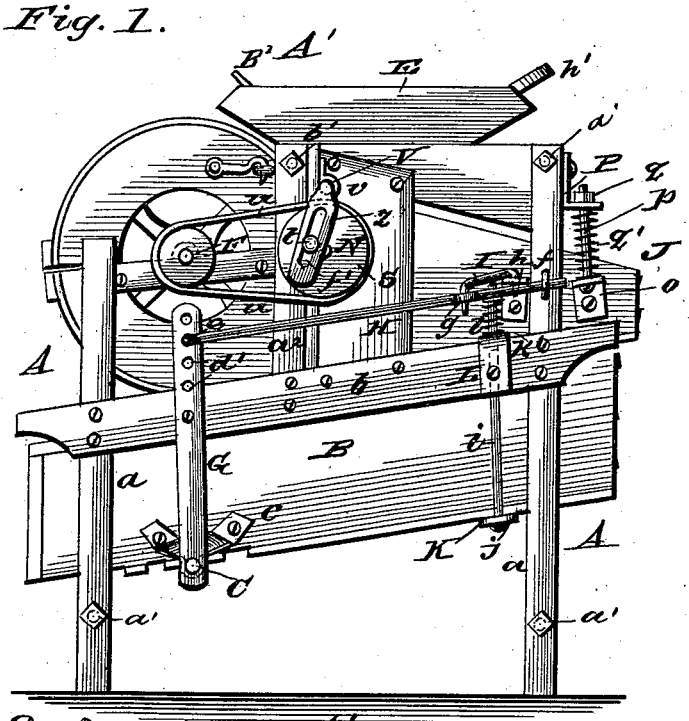
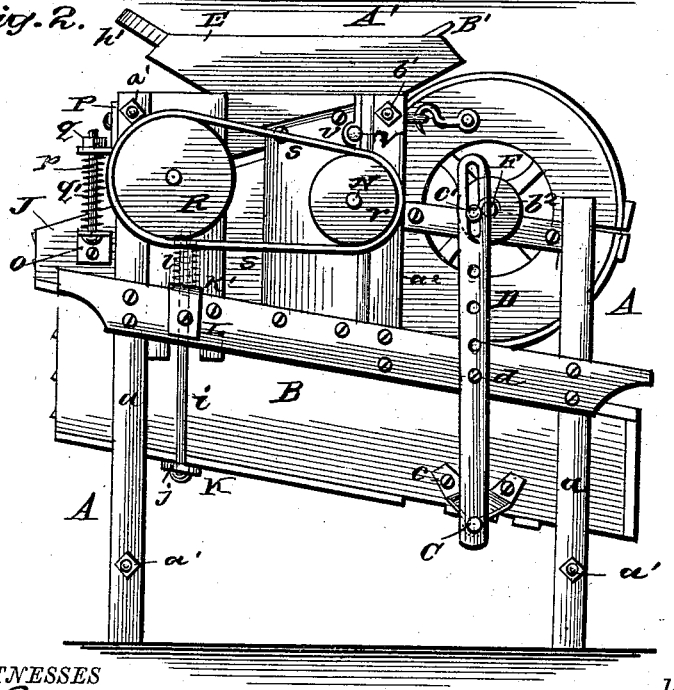


Fig. 2.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

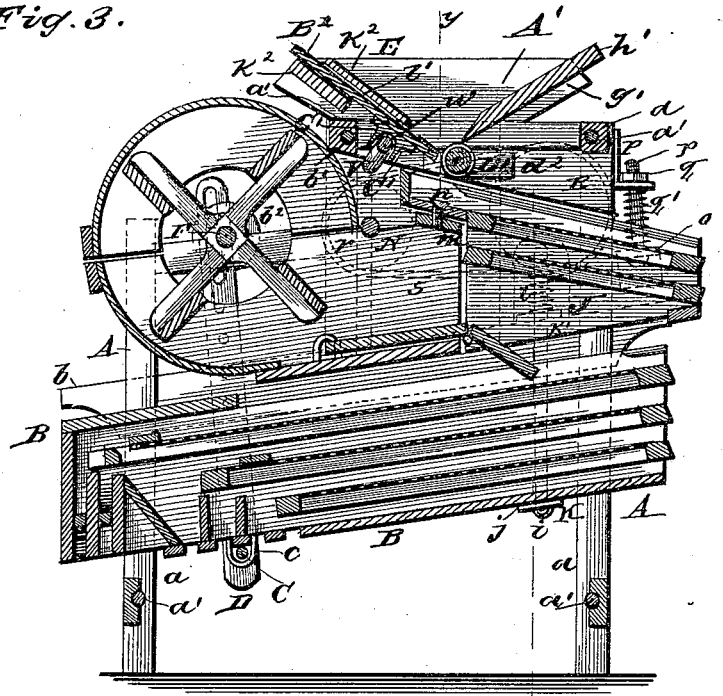
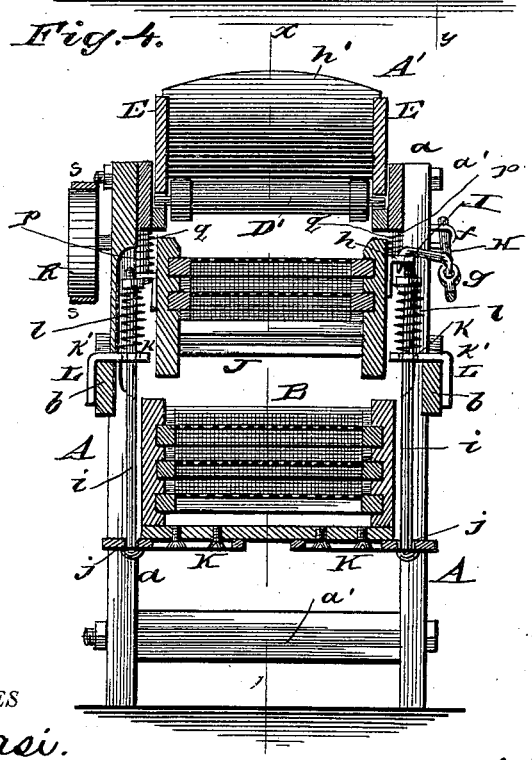


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES F. HATFIELD, OF CAMBRIDGE CITY, INDIANA.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 306,612, dated October 14, 1884.

Application filed April 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. HATFIELD, a citizen of the United States, residing at Cambridge City, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Grain-Separators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a view of one side of my machine. Fig. 2 is a view of the opposite side. Fig. 3 is a vertical sectional view of the same, and Fig. 4 is a transverse section.

This invention has relation to improvements in machines for separating grain; and it consists in the construction and novel arrangement of devices, as will be hereinafter more fully set forth, and particularly pointed out in the claims appended.

In the accompanying drawings, the letter A indicates the frame, which consists, principally, of four posts, *a*, and two longitudinally-inclined side beams, *b*. The posts extend a sufficient distance beneath the grain-box to serve as legs for supporting the machine, and are secured together at their lower ends by means of transverse rods and nuts, as shown at *a'*.

In addition to the vertical posts *a* are two intermediate short vertical posts, a^2, arranged one at each side of the machine, and are also connected at their upper ends by a transverse bolt, *b'*, in a similar manner to the said posts *a*, which together constitute a support for the hopper-frame E. By this construction it will be perceived that the frame may be quickly put together and as quickly taken apart when desired for transportation.

B indicates the grain-box, which may be of any approved construction, and is suspended at its rear or elevated end from the inclined side rails of the frame in spring-bearings, as will be hereinafter explained. The lower side walls of this grain-box are provided with brackets *c*, in which is journaled the transverse shaft C, for supporting the lower end of the said box. This shaft C extends a sufficient distance at both sides of the frame, and has secured at one end a vertical bar, D, which is slotted at its upper end, and thereby engages a crank-pin, *c'*, on a wheel, b^2, which is rigidly secured to one end of the fan-shaft F. The bar D is also pivoted to the side rails of the frame, as shown at *d*, and receives a vibratory movement from the fan-shaft, which is imparted to the grain-box. From the opposite end of this shaft C rises a vertical bar, G, which is centrally pivoted to the side rail of the frame, and is provided at its upper end with a series of perforations, *d'*.

H indicates a rod, which is provided at one end with a bent portion, *e*, to engage one of the perforations *d'* of the vertical bar G, which is secured to the grain-box. This rod H has its opposite end supported in a loop-bearing, *f*, and is provided with an eye, *g*, by means of which, through the medium of a link, I, a loose connection is had with the chaff-shoe, as shown at *h*, whereby motion received from the fan-shaft through the medium of the slotted bar and transverse shaft C may be imparted to the chaff-shoe J, which will cause it to vibrate transversely with relation to the grain-box beneath, the perforations in the vertical bar G being to lengthen or shorten the vibrations of the chaff-shoe according to the quality of grain to be separated.

K K indicate plates which are secured to the bottom of the forward or elevated side of the grain-box, and are provided with vertical eyes *j*, through which are inserted vertical headed bolts *i*, which also extend through vertical eyes *k* in the inwardly-extending arms *k'* of the angle-brackets L, which are secured to the longitudinally-inclined side rails of the main frame. The upper ends of these bolts are threaded, as shown, and have interposed between the nuts thereon and the arms *k'* spiral or coil springs *l*, which have their lower ends bearing upon the said arms *k'*.

J indicates the chaff shoe or frame, which is centrally pivoted at its rear or elevated end by means of a bolt passing through the transverse bar *m* of the fan-case, as shown at *n*, and this frame is hung at its opposite end in bearings in the following manner: The side walls

of the chaff shoe or frame are provided with laterally-projecting perforated arms *o*, through which are inserted vertical threaded bolts *p*, and through eyes in similar brackets P, secured to the upper ends of the main frame. These bolts *p* are loosely secured in the brackets by means of nuts *q*, and between the brackets of the chaff-frame and main frame, around the bolts *p*, are respectively interposed coiled springs *q'*. Thus it will be seen that when motion is imparted to the chaff-shoe through the medium of the longitudinally-sliding rod H and link I, it may have a slight vertical and transverse vibratory movement, as the springs pressing down upon the brackets of the said chaff-shoe and the bolts *p*, arranged loosely in the bearings, will allow its sides to rise alternately at each vibration.

N indicates the main operating-shaft, which extends transversely of the main frame, and has its bearings in boxes on the intermediate vertical posts thereof. This shaft is provided at one end with a pulley, *r*, which receives motion by means of a suitable band or belt, *s*, from the power-wheel R, and is provided at its opposite end with a fixed pulley, S, which is provided on its outer side with a crank-pin, *t*. This pulley S imparts power to a drum or pulley on the fan-shaft by a belt, *u*. Above this drive-shaft N is journaled in bearings *v* on the intermediate posts of the frame a rock-shaft, V, which is provided with a rectangular loop or crank, *w*, about midway between the inner walls of the hopper-supporting frame, and this shaft is also cranked or bent downwardly at its outer end, *z*, over the outer face of the pulley S, and is provided with a vertical slot, *f'*, for the passage of the crank-pin *t*.

The hopper A' may be of the ordinary construction, having its side walls obliquely grooved on their inner faces, as shown at *g'*, to serve as bearings for the removable board *h'*, and near their opposite inner ends with obliquely-arranged transverse strips *k²*, having an interspace, *l'*, for the insertion of a sliding feed-board, B'. This feed-board is provided on its under side with a transversely-grooved plate or casting, C', which is designed to engage the intermediate crank or looped portion of the rock-shaft.

In the side walls of the hopper-supporting frame are bearing-blocks *d²*, for supporting a transverse roller, D', which is arranged directly beneath the discharge-opening of the hopper. By this construction it will be perceived that when motion is communicated to the crank rock-shaft it will be imparted to the diagonally-vibrating feed-board in the hopper, and the lower edge of this board striking the roller on every downward movement will impart an intermittent rotary movement to the said transverse roller in the hopper-supporting frame beneath the hopper discharge-opening, thereby preventing any choking or clogging of the grain therein during the operation of the machine.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a grain-separator, the combination, with the cranked and slotted rock-shaft having an intermediate loop between the walls of the hopper and the hopper, of the hopper-slide, having the casting C' on its under face, the roller D, the pulley carrying the crank-pin *t*, and means for operating the same, substantially as specified.

2. The combination, with the longitudinally and vertically vibrating grain-box having the spring-bearings, of the laterally-vibrating cradle or chaff-shoe, the engaging-springs *q'*, and means for operating said grain-box and chaff-shoe, substantially as specified.

3. In a grain-separator, the combination, with the main frame, of the longitudinally and vertically vibrating grain-box, the laterally-vibrating cradle or chaff-shoe, the transverse shaft journaled to the under side of the lower portion of the grain-box, the vertical pivoted bars rising from the respective ends of the said transverse shaft, one bar being slotted and engaging a crank-pin on the fan-shaft, and the other bar having a series of perforations at its upper end, a longitudinally-sliding rod connecting with the cradle or chaff-shoe, and mechanism for operating the same, whereby the described movements are given to the grain-box and cradle, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES F. HATFIELD.

Witnesses:
SAMUEL HALL,
W. F. MEDSKER.